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|---|---|---|---|---|---|
| **22** | eg $x^2+(3x-1)^2=3x-1+11$ | eg $\left(\frac{y+1}{3}\right)^2+y^2=y+11$ | | 5 | M1 for substitution of $y=3x-1$ (or $x=\frac{\pm y\pm 1}{3}$) into $x^2+y^2=y+11$ to obtain an equation in $x$ only (or $y$ only) |
| | $10x^2-9x-9(=0)$ oe **or**<br>$10x^2-9x=9$ oe **or**<br>$10x^2=9+9x$ oe | $10y^2-7y-98(=0)$ oe **or**<br>$10y^2-7y=98$ oe **or**<br>$10y^2=98+7y$ oe | | | M1ft dep on previous M1 for multiplying out and collecting terms, forming a three term quadratic in any form of $ax^2 + bx + c$ (= 0) where at least 2 coefficients ($a$ or $b$ or $c$) are correct |
| | $(5x+3)(2x-3)(=0)$<br>**or**<br>$(x=)\frac{9\pm\sqrt{(-9)^2-4\times10\times(-9)}}{2\times10}$<br>**or**<br>$10\left[\left(x-\frac{9}{20}\right)^2-\left(\frac{9}{20}\right)^2\right]-9(=0)$<br>**or**<br>$x=-0.6$ and $x=1.5=\frac{3}{2}$ | $(5y+14)(2y-7)(=0)$<br>**or**<br>$(y=)\frac{7\pm\sqrt{(-7)^2-4\times10\times(-98)}}{2\times10}$<br>**or**<br>$10\left[\left(y-\frac{7}{20}\right)^2-\left(\frac{7}{20}\right)^2\right]-98(=0)$<br>**or**<br>$y=-2.8=-\frac{14}{5}$ and $y=3.5=\frac{7}{2}$ | | | M1ft dep on first M1 method to solve **their** 3 term quadratic using any correct method (allow one sign error and some simplification – allow as far as eg $\frac{9\pm\sqrt{81+360}}{20}$ **or** $\frac{7\pm\sqrt{49+3920}}{20}$ **or** if factorising allow brackets which expanded give 2 out of 3 terms correct)<br>**or** correct values for $x$<br>**or** correct values for $y$<br>(Allow incorrect labels for $x$ or $y$ for this mark only) |
| | ($y$ =) 3 × "−0.6" − 1 (= −2.8)<br>**and**<br>($y$ =) 3 × "1.5" − 1 (=3.5) | $(x=)\ \frac{"-2.8"+1}{3}(=-0.6)$<br>**and** $(x=)\frac{"3.5"+1}{3}(=1.5)$ | | | M1ft dep on previous M1 for substituting **their** 2 found values of $x$ or $y$ into one of the two given equations<br>**or** fully correct values for the other variable |
| | *Working required* | | $x=-0.6$<br>$y=-2.8$<br>$x=1.5$<br>$y=3.5$ | | A1 oe dep on M2 for 4 correct values correctly labelled or correctly shown as coordinates |
| | | | | | **Total 5 marks** |